

Building Up the Farm.

Editor of The Progressive Farmer:

The farm ought to be the most attractive spot on the globe, and how to make it so and to keep it so should be the aim of every farmer in the land. There is a magic power in the soil which give life and strength to whatever lives upon it. From the soil comes the food, clothing, and the homes of all mankind; from the soil comes directly or indirectly every material for human satisfaction and enjoyment. Therefore, it is the duty of every farmer or owner of soil to build up the same and yearly improve its fertility to make it capable of furnishing the materials in an increasing quantity, necessary for the benefits of mankind. Our soils of the South are poorer than the average soil of the continent, and for that reason demand a better system of culture in the way of studying the proper rotation of crops, and the proper methods of fertilizing our various crops, so that the proper plant foods are provided in the best form to get best results. Some one has said of the South, that it seemed as if nature after making a climate perfectly suited to health and labor had bestowed upon it a poorer soil, and thus compelled us to reach that high degree of human endeavor, which can be achieved only by the aid of so perfect a climate. The chief pursuit and chief source of our wealth is agriculture, but at the same time our average yields per acre are barely more than half of the average of the United States. Take such crops as corn. The average of the United States is 25 bushels. The average of the extreme Southern States is only 11 bushels. True our yield of cotton and tobacco is above the average in quantity, but is also above the average in cost of production. The cost of production is the real test of the actual profit per acre on any farm, hence we should aim to increase the fertility of the soil so as to increase the production, for it costs no more to produce 25 bushels of corn per acre, as far as labor is concerned, than it does to produce 11. We still cling too much to extensive methods, forgetting the fact that we live in an age of mental activity and physical effort and that we must face the problems that confront us with a spirit determined to overcome all difficulties. All crops grown on the farm are valuable for some purpose and unless they are so they should not be planted, but there are by-products from all crops that are often wasted, and which, if put in the place they belong to, viz., the manure heap, would considerably increase the fertility of the soil, for it is from the manure pile that the refuse of the farm is distributed to be harvested again in other forms. Another form of bad farm practice is the neglect of the proper rotation of crops. The question of crop rotation while the oldest of all questions connected with agriculture is yet ever the newest. If we go back a couple of thousand years and study the rules laid down by ancient writers on this subject, we should be surprised to

learn how little advancement we have really made during all that time.

In fact, the average farmer of to-day is not better versed in the art of rotation than was the Egyptian in the early centuries. Professors and chemists in our agricultural colleges have done, and are doing good work in clearing up some of the mysteries connected with it by explaining the reasons why. And some of our farmers of to-day might mystify and puzzle their ancient brothers by going into details of chemical analysis about phosphates, carbohydrates, etc., etc., but in turn the ancient tiller of the soil might astonish his modern wisdomship by revealing a practical application of the subject that he never dreamed of. We have only to look at China at the present time to confirm all this, where we find the most ancient methods practiced with the fertility of the soil almost unimpaired though it has been in constant cultivation for an untold number of years.

But we are not prepared to adopt the Chinaman's methods. We aim to get the most out of life that is in it, and, therefore, we must use the means at our command to build up and uphold the fertility of our soils so as to give us the best returns for time and labor; to that end we have to study and put in practice the best known methods. The farmer who makes a study of the relationship of one crop to another as far as plant food in the soil is concerned belong to those who are successful in their calling. The principles that govern this relationship have been revealed to us in such simple form that they may be easily understood by any farmer of ordinary intelligence. For instance, we are told that the amount of potash entering into the mineral constituents of our common root crops is nearly or quite twice that contained in ordinary grain crops; or take phosphoric acid, we find that grain crops contain three times the amount that is in the root crops and so on all the way through the list, thus conclusively showing us that successive crops of the one variety will surely impoverish any soil in a short time. And it is the knowledge of these facts that enables the intelligent farmer of to-day to increase the fertility of his soil as years pass by and to make his farm more productive. But before I finish this subject I would like to emphasize that in our Southern soils the plant food element which is most lacking, is potash, and hence the necessity for supplying it liberally. Phosphate again, while present in larger quantities in many cases is not readily available for plant because insoluble and must also be applied in conjunction with the potash. But potash, as the principal starch and sugar producer in plants and, being as it were, the finisher of all crops, grain, roots, or fruit, is the essential element always, and every farmer should make particular note of that fact, and act accordingly.

C. K. McQUARRIE.

To do so no more is the truest repentance.—Luther.

EASY SCIENCE STUDIES FOR FARMERS.**XII.—How Plants Grow.**

It will pay any of the boys on the farm to take a little time and trouble just now, even if it is a busy time, to ascertain for themselves just how plants grow. Take, for example, a hill of corn three or four inches high, scrape off the surface carefully, take a bucket of water, or several of them if needed, and wash away the soil from the roots so as to expose the roots as much as possible, and study them. They will be surprised at the extent of the root system of a corn plant even four inches high. We will tell them, for they perhaps might not suspect it, that the tip of the plant-root exudes or discharges an acid which has the power of dissolving to a certain extent the mineral matter of the soil. Plants take no solid food. There is ash in the mature plant, woody fiber, as well as grain, but the materials of all these must be taken up in liquid form. Plants do not eat, they drink.

They will find in examining this plant that the large roots are simply conduits, pipes to take up this liquid matter, this dissolved food. They will find that the food is mostly taken up by what is called hair roots. If they will pull up another hill of corn and shake off the dirt they will find a good deal of dirt sticking very closely to the hair roots. These are simply elongated cells which push out from the roots and almost glue themselves to the fine particles of dirt. If the boys study this awhile, they will see for themselves how exceedingly important it is to have a properly prepared seed bed, a seed bed in which the particles are in such condition that the roots can move freely and that these hair roots can come in the closest possible contact with the largest amount of soil.

The plant, however, feeds from the air as well as from the soil. The boys have all noticed that when corn comes up the stalk is round and hard and pointed. This is to enable it to push its way through the soil. As soon, however, as it comes in contact with the sunlight it begins to turn green, then unrolls itself and spreads a large amount of leaf surface to the air. Why does it do this? To breathe, for the plant not only drinks but breathes. They will notice further that all healthy plants have green leaves. When corn begins to turn yellow it is sickly. This green matter is called chlorophyll. It is the workshop of the plant. This green coloring matter is enabled during the day time and when the sun is shining to take the carbon dioxide of the air, dissolve it, and use the carbon, of which plants are most largely built up, for the building up of leaf structure. The boys all notice that corn does not grow much on cloudy days. This laboratory of the plant can not run except with sunlight. The more sunlight, when there is plenty of moisture, the more rapid the growth.

This carbon taken up from the air, together with the soluble solids taken

up by the roots, circulates in the plant in the form of sap and in this way the plant is built up from day to day and from month to month. Bear in mind that the plants feed from the air as well as from the soil. They drink from the soil; they breathe from the air. The more leaf structure, the larger the factory upstairs; the more root extension, the larger the factory downstairs. The stalk simply connects these two factories and enables them to interchange products, and, so to speak, work together.

Inasmuch as the food from the soil must be taken up altogether in the form of water as drink, one can readily see the necessity of an abundant supply of water and see why it is that the amount of water available, other things being equal, determines largely the extent of the crop. The corn plant, as we have often told the boys, works from planting time until tasseling time simply to get a good ready. It is simply building up the workshop down stairs and upstairs; but when it tassels out and silks begin to form, then it gets down to business and four-fifths of the dry matter of the total plant is created between tasseling time and the full harvest. This is the reason why a scarcity of water at this season either above or below means a short crop.—Dr. Henry Wallace, in Wallace's Farmer.

Information Wanted About North Carolina Tobacco Lands.

We suppose we cannot do better than to publish the following letter in full, and let those of our readers who are interested write Mr. Metz direct, or answer through our columns. Mr. Metz is a prominent business man of Cleveland, and doubtless "means business" in this matter as in others:

Dear Sir:—Enclosed find \$1.00 for one year's subscription to your paper. I am very much interested in North Carolina tobacco lands, with a view to making my home in your State. I wish to accomplish this purpose as soon as possible and to this end will greatly appreciate whatever information you may be able to give me.

Your Commissioner of Agriculture, Mr. S. L. Patterson, has kindly furnished me the names of counties in which the best tobacco is principally grown. As this section is no doubt well known to you, I would ask as to which is the best section as regards healthful climatic conditions? How are Martin, Pitt and Edgecombe Counties in this regard? Is good tobacco produced in them? When would it be necessary for me to go to North Carolina in order to prepare such place as I may choose for next year's crop? Where and for what return could I get a good man to assist me as to curing, etc., and generally instruct me in the art of raising tobacco? I should like to clear an annual net profit of from \$4,000 to \$5,000. What size place would this necessitate? What total outlay would this require? What implements would it be necessary to have? What sized tobacco plantation would one man successfully manage?

CHAS. J. METZ.

Lake and Wason Streets, Cleveland, Ohio, June 4, 1903.